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ABSTRACT:

PURPOSE: To provide an ink-jet recording device which can maintain a function of an optical sensor detecting a width of recording paper and perform accurate and appropriate recording.

CONSTITUTION: The ink-jet recording device performs recording by discharging ink to a recorded medium from recording heads 9A-9D, which is provided with a wiping mechanism 30 wiping nozzle surfaces of the recording heads 9A-9D and a paper width detecting sensor which is arranged on a carriage 6 moving the recording heads 9A-9D and detects optically a width of the recorded medium, a quantity of discharging ink is stored accumulatively in a data memory 23, when the quantity of the discharging ink stored accumulatively becomes at least a prescribed quantity, the carriage 6 and wiping mechanism 30 are controlled by a CPU 21, the surface of the paper width detecting sensor is wiped by the wiping

mechanism 36 and dirt is removed.

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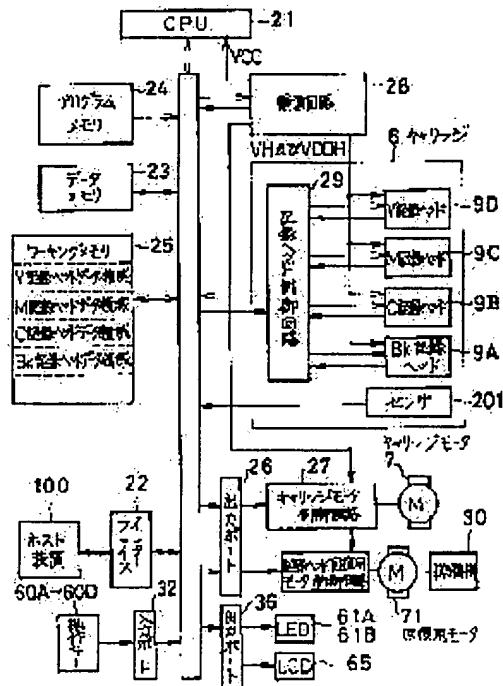
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(54) INK-JET RECORDING DEVICE

(57) Abstract:

PURPOSE: To provide an ink-jet recording device which can maintain a function of an optical sensor detecting a width of recording paper and perform accurate and appropriate recording.

CONSTITUTION: The ink-jet recording device performs recording by discharging ink to a recorded medium from recording heads 9A-9D, which is provided with a wiping mechanism 30 wiping nozzle surfaces of the recording heads 9A-9D and a paper width detecting sensor which is arranged on a carriage 6 moving the recording heads 9A-9D and detects optically a width of the recorded medium, a quantity of discharging ink is stored accumulatively in a data memory 23, when the quantity of the discharging ink stored accumulatively becomes at least a prescribed quantity, the carriage 6 and wiping mechanism 30 are controlled by a CPU 21, the surface of the paper width detecting sensor is wiped by the wiping mechanism 36 and dirt is removed.



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CLAIMS

[Claim(s)]

[Claim 1] The nozzle depuration means which is the ink-jet recording device which records on a record medium-ed by breathing out ink from a record head, and wipes the nozzle side of a record head, A paper width detection means to arrange in the carriage to which a record head is moved, and to detect the width of face of a record medium-ed optically, The ink-jet recording device characterized by having a dirt decision means to judge the dirt of a paper width detection means, and a control means to control a ***** nozzle depuration means to decision of a dirt decision means, and to make the dirt elimination operation to a paper width detection means perform to it.

[Claim 2] It is the ink-jet recording device characterized by displaying the purport whose paper width detection means is failure on a display means when it judges with not judging and removing whether the dirt of a paper width detection means was removed when it has a display means to tell the status of an ink-jet recording device outside in addition to a configuration according to claim 1 and a nozzle depuration means performs the dirt elimination operation to a paper width detection means.

[Claim 3] The aforementioned record head is an ink-jet recording device according to claim 1 or 2 which it is the record head which carries out the regurgitation of the ink using heat energy, and is an ink-jet record head equipped with the heat energy conversion field for generating the heat energy given to ink.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink-jet recording device which breathes out ink from the record head which scans a record medium-ed, and records on a record medium-ed.

[0002]

[Description of the Prior Art] Drawing 2 is a perspective diagram showing the configuration schema of the ink-jet recording device which performs the conventional color record.

[0003] In drawing 2, the record media 1, such as a form or a plastics sheet, are supported with the conveyance rollers 2 and 3 of the couple arranged at the upper and lower sides of a record section, and are conveyed in the orientation of arrow head A with the conveyance roller 3 driven by the sheet delivery motor 4. Ahead of the conveyance rollers 2 and 3, the guide shaft 5 is formed in this and parallel. Along with this guide shaft 5, carriage 6 goes in the orientation of arrow head B through a wire 8 by the output of the carriage motor 7.

[0004] The record head 9 which is an ink-jet head is carried in the carriage 6 as a head move means. This record head 9 is an object for color pictures, is arranged at the scanning direction of carriage and consists of cyanogen (C), ***** (M), yellow (Y) and four record heads 9 that the ink of each color of black (Bk) was made to correspond, and were prepared, i.e., black head 9A, cyano head 9B, ***** head 9C, and yellow head 9D, respectively. Each record head sets a certain fixed spacing (for example, 12mm), and is arranged. Moreover, on carriage, the optical means 201 of the infrared reflex type sensor for detecting the paper width which is a scanning direction to a record medium-ed etc. is arranged. The ink regurgitation section arranged to the vertical single tier is prepared in the orientation which makes the ink delivery of a plurality (for example, 48 pieces or 64 pieces) the front face of each record head 9, i.e., the field which sets the recording surface and predetermined spacing (for example, 0.8mm) of a record medium 1, and opposes, intersect the scanning direction of carriage.

[0005] The display 65 containing Light Emitting Diodes for an alarm, such as two or more others and alarms Light Emitting Diode 61A, power Light Emitting Diode 61B, etc., is formed in the control panel 160 attached in the sheathing case (un-illuminating) of a recording device. [sections / key setting /, such as online / off-line switching key 60A line-feed key 60B, form-feed key 60C and recording-mode switching key 60D,]

[0006] When performing a record operation, on the basis of the record data sent from the host equipment 100, CPU with which the control section (un-illuminating) was equipped, and its circumference circuit use the sheet delivery motor 4 for conveyance first, and move the record medium 1-ed to a position. Next, the width of face (paper width) in the scanning direction of a record medium-ed is detected using the optical means 201 of an infrared reflex type sensor etc., moving carriage 6. The record data sent from the host equipment 100 on the basis of this paper width are processed, the record head 9 is controlled, and record suitable on the record medium 1-ed is performed.

[0007] The main fractions of the ink-jet record head (henceforth a record head) 9 of the ink-jet recording device which records by the ink-jet method consist of a nozzle fraction which carries out the regurgitation of an ink tank and the ink drop. A basic operation of such a record head is explained with reference to drawing 3.

[0008] Drawing 3 is a block diagram having shown typically record head 9 (either of the record heads 9A-9D is the same) cross section shown in drawing 2.

[0009] In drawing 3, two or more ink regurgitation nozzles 10 which prepared the ink delivery for making ink breathe out in the orientation which intersects perpendicularly with a scanning direction at the predetermined spacing are formed in the record head side which counters the record media 1-ed, such as the recording paper. Each ink regurgitation nozzle 10 is filled with ink 13. The electric thermal-conversion field 11 is formed in each ink regurgitation nozzle 10, respectively, and the heat driver 14 for turning on / turning off energization of this electric thermal-conversion field 11 is formed, respectively.

[0010] The circuit board equipped with the control circuit 29 for performing the above-mentioned energization control is arranged at carriage 6 (drawing 2). From this control circuit 29, a record data signal and a heat signal are outputted, respectively, and it is inputted into the record data serial/parallel-conversion circuit 16 and the heat signal generating circuit 17 on the record head 9, respectively. The heat-driver 14 which should energize is chosen by the signal outputted from the circuit of these both.

[0011] If the heat driver 14 is chosen and energization is turned on, energization heating of the electric thermal-conversion fields (exoergic resistor etc.) 11 established to each ink regurgitation nozzle 10 will be carried out, they will make a film-boiling phenomenon occur in the ink in the ink regurgitation nozzle 10, and will generate a bubble (foam) 12. Ink is made to breathe out from the ink regurgitation nozzle 10 by the pressure buildup by this bubble 12, and flight ink drop 13A is formed. Record by the dot pattern is performed by making this ink drop 13A adhere on the record medium 1-ed.

[0012] Then, if energization of the exoergic resistor 11 is turned off, the ink regurgitation nozzle 10 will be cooled and a bubble 12 will disappear. And ink 13 is more newly than ink liquid route 10A supplied, and the ink regurgitation nozzle 10 is again filled with ink 13.

[0013]

[Problem(s) to be Solved by the Invention] The paper width detection means using the conventional optical means is

explained with reference to drawing 4.

[0014] In drawing 4, 1 is record media-ed, such as paper, and 202 is a platen. 6 expresses carriage and carries each record head and the paper width detection sensor 201 of Y, M, C, and BK.

[0015] The general internal configuration of the optical reflex type sensor 201 consists of photo diode 201a and photo transistor 201b, as shown in drawing 5. It is reflected on the platen 202 or the record medium 1-ed, and incidence of the light, such as infrared radiation emitted from photo diode 201a, is carried out to the light-receiving fraction of photo transistor 201b. The collector fraction of photo transistor 201b is beforehand connected with power (the example of illustration 5 V) through resistance, and the potential of this collector fraction is changed by the incident light, as shown in drawing 6.

[0016] The paper width detection means using the conventional optical means is recognized by detecting the level difference of the quantity of light in which it is reflected in case there is nothing with the time of there being a record medium-ed, namely, -- if larger [as compared with a certain fixed judgment level] in an output than it -- a platen -- if small, it will be judged as the record medium-ed.

[0017] In an ink-jet recording device, since it records by making ink breathe out from a record head nozzle, when prolonged record is performed, the mist-like ink (it is called Myst below) which bounded from the record medium-ed may adhere to the aforementioned reflected type sensor 201. The level detected will be changed if a sensor 201 becomes dirty according to this Myst. Since the amount of incident lights becomes small, the level under record-medium-ed scanning goes up by the above-mentioned example, and in it, paper width becomes unable to detect correctly.

[0018] Since the same is said of the ** case by which photo diode 201a of a sensor was destroyed by a certain cause, in the equipment which has such a control, it may stop recording the further above-mentioned unusual status by judging that it is failure of a sensor accidentally.

[0019] This invention was accomplished in order to cancel the trouble of the above-mentioned conventional technique, it maintains the function of the optical sensor which detects the width of face (paper width) of the scanning direction of a record medium-ed, and aims at offering the ink-jet recording device which can perform exact and suitable record.

[0020]

[Means for Solving the Problem] For this reason, the ink-jet recording device concerning this invention The nozzle depuration means which is the ink-jet recording device which records on a record medium-ed by breathing out ink from a record head, and wipes the nozzle side of a record head, A paper width detection means to arrange in the carriage to which a record head is moved, and to detect the width of face of a record medium-ed optically, The configuration characterized by having a dirt decision means to judge the dirt of a paper width detection means, and a control means to control a ***** nozzle depuration means to decision of a dirt decision means, and to make the dirt elimination operation to a paper width detection means perform to it tends to attain the aforementioned purpose.

[0021]

[Function] By the above configuration, the paper width detection means arranged in carriage detects the width of face of a record medium-ed, a record head is moved with carriage, and it records on a record medium-ed by breathing out ink. Moreover, the nozzle side of a record head is wiped by the nozzle depuration means.

[0022] And a control means controls a ***** nozzle depuration means to the decision of a dirt decision means which judges the dirt of a paper width detection means, performs the dirt elimination operation to a paper width detection means to it, and maintains the function of a paper width detection means normally.

[0023]

[Example] Drawing 1 is a block diagram showing the configuration of one example of this invention. In addition, conventionally [aforementioned], the same sign has shown equipment, the identity, or the corresponding fraction, and it omits a duplication explanation.

[0024] In drawing 1, it connects with the host equipment 100 through the interface 22, and CPU21 which is a microprocessor controls a record operation based on the command signal (command) and record information signal which were read into the working memory 25 from the program stored in the program memory 24 of ROM gestalt, the data memory 23 of EEPROM gestalt, etc., or record command data and the host equipment 100.

[0025] Moreover, when not recording, the motor for recovery 71 (drawing 1) for [which consists of the absorber and its designation member for wiping the capping device for protecting a record head and the nozzle side of a record head] wiping and operating the device 30 (drawing 1) and these is formed in the fraction hidden in the carriage 6 shown in drawing 2.

[0026] When performing a record operation, CPU21 and its circumference circuit on a control board (un-illustrating) move the record medium 1-ed to a position first using the sheet delivery motor 4 for conveyance on the basis of the record data sent from the host equipment 100. Next, the width of face (paper width) in the scanning direction of a record medium-ed is detected using the optical means 201 of an infrared reflex type sensor etc., scanning carriage 6. The record data sent from the host equipment 100 on the basis of this paper width are processed, the record head 9 is controlled, and record suitable on the record medium 1-ed is performed.

[0027] And CPU21 calculates the amount of the ink which carries out the regurgitation based on the recording information stored in data memory 23, and makes data memory 23 carry out the accumulation storage of this. When it becomes beyond the value with this amount of ink accumulation, it is wiped with carriage 6, CPU21 controls a device 30, wipes the front face of a sensor 201, and wipes it according to a device 30.

[0028] By the above-mentioned configuration, ink is breathed out from two or more record heads 9A-9D from which an ink color is different, and color record is performed. And it wipes and the nozzle side of a record head is wiped according to a device 30. Furthermore, when the ink of the specified quantity is breathed out, by wiping and wiping the front face of the optical means 201 which is a paper width sensor according to a device 30, paper width can always be detected correctly and suitable color ink-jet record can be carried out.

[0029] (others -- example) the above-mentioned example, although it is the configuration which wipes and wipes the paper width sensor 201 according to a device 30 when the amount of ink breathed out is memorized and a certain constant rate is exceeded It can also consider as the configuration which wipes when level becomes high rather than this as compared with a certain constant value smaller than the judgment level which showed the level at the time of a record-medium-ed scanning in

drawing 6 when it does not restrict to this, for example, it detects paper width, and controls.

[0030] The level of a record medium-ed before controlling by furthermore wiping in this case is memorized in the working memory 25, after controlling by the paper width sensor 201 wiping, when the level of a record medium-ed is measured again and there is no change in level, it can judge that it is failure of paper width sensor 201 the very thing, and if can also consider as the configuration which performs the control which makes this know outside at the alarm lamp of a control panel 160 or the plotting board, a buzzer, etc.

[0031] By the above-mentioned configuration, the same effect as the aforementioned example can be exhibited.

[0032] Especially, this invention forms a flight-drop also in an ink-jet recording method using heat energy, and brings the effect which was excellent in the record head of the ink-jet method which records, and the recording device.

[0033] About the typical configuration and typical principle, what is performed using the fundamental principle currently indicated by the U.S. patent specification of No. 4723129, and this No. 4740796 specification, for example is desirable.

Although this method is applicable to both the so-called on-demand type and a continuous system. On the electric thermal-conversion field which is especially arranged corresponding to the sheet and passage where the liquid (ink) is held in the on-demand type case By impressing at least one driving signal which gives the rapid temperature rise which corresponds to recording information and exceeds nucleate boiling Since make the electric thermal-conversion field generate heat energy, the heat operation side of a record head is made to produce film boiling and the foam in the liquid (ink) corresponding to this driving signal can be formed by the couple 1 as a result, it is effective. A liquid (ink) is made to breathe out through opening for regurgitation by growth of this foam, and deflation, and at least one drop is formed. If this driving signal is made into the shape of a pulse form, since growth deflation of the foam will be performed pertinently instantly, the regurgitation of a liquid (ink) excellent in especially responsibility can be attained, and it is more desirable.

[0034] As a driving signal of the shape of this pulse form, what is indicated by the U.S. patent specification of No. 4463359, and this No. 4345262 specification is suitable. In addition, if a publication, now the conditions which are adopted as the U.S. patent specification of No. 4313244 of invention about the rate of a temperature rise of the above-mentioned heat operation side, further excellent record can be performed.

[0035] It is good also as a configuration using the U.S. patent specification of No. 4558333 which indicates the configuration arranged to a delivery which is indicated by each above-mentioned specification as a configuration of a record head, the liquid route, and the field to which the heat operation section other than the combination configuration (a straight-line-like liquid flow channel or right-angled liquid flow channel) of the electric thermal-conversion field is crooked, and the U.S. patent specification of No. 4459600.

[0036] In addition, it can also consider as the configuration based on JP,59-138431,A which indicates the configuration whose puncturing which absorbs the pressure wave of JP,59-123670,A which indicates the configuration which makes a common slit the regurgitation section of the electric thermal-conversion field, or heat energy is made to correspond to the regurgitation section to two or more electric thermal-conversion fields.

[0037] Furthermore, any of the configuration which fills the length with the combination of two or more records head which is indicated by the specification mentioned above as a record head of the full-line type which has a length corresponding to the width of face of the maximum record medium which can record a recording device, and the configuration as one record head formed in one are sufficient.

[0038] In addition, you may use the record head of the exchangeable chip type with which the electric connection with the mainframe of equipment and supply of the ink from the mainframe of equipment are attained, or the record head of the cartridge type with which the ink tank was formed in the record head itself in one by the mainframe of equipment being equipped.

[0039] Moreover, since the effect of this invention can be stabilized much more, it is desirable to add the recovery means for a record head, a preliminary supplementary means, etc. It is effective in order to perform record stabilized by performing the reserve regurgitation mode in which the preheating means by the capping means, the pressurization or the suction means, the electric thermal-conversion field, the heating elements other than this, or such combination over a record head and the regurgitation other than record are performed, if these are mentioned concretely.

[0040] Furthermore, by constituting not only the recording mode of only mainstream colors, such as the nigrities, but a record head in one as a recording mode of a recording device, even with two or more combination, although it is good, it can also consider as the equipment equipped with full color at least one by the double color color of a different color, or color mixture.

[0041] In this invention example explained above, although ink is explained as a liquid The thing which is ink solidified less than [a room temperature or it], and is softened at a room temperature, or the thing which is a liquid, Or in an above-mentioned ink-jet method, since what carries out a temperature control is common as a temperature control is performed for ink itself by within the limits [70 degrees C or less] 30 degrees C or more and it is in a stable regurgitation domain about the viscosity of ink, ink should just make the shape of liquid at the time of use record signal grant.

[0042] In addition, it carries out whether the ink which prevents by making the temperature up by heat energy use it positively as energy of the change of state from the solid status to the liquid status of ink, or is solidified in the state of neglect for the purpose of the antiflashing of ink is used. Anyway, ink liquefies by grant according to the record signal of heat energy. Use of the ink of the property liquefied for the first time with heat energy, such as what carries out the regurgitation as liquefied ink, and a thing which it already begins to solidify when reaching a record medium, is also applicable to this invention. In such a case, ink is good also as liquefied to a porous material sheet concavity or a breakthrough which is indicated by JP,54-56847,A or JP,60-71260,A, or gestalt which counters to the electric thermal-conversion field in the status that it was held, as a solid. In this invention, the most effective thing performs the film-boiling method mentioned above to each ink mentioned above.

[0043] Furthermore, in addition, as gestalt of the recording device concerning this invention, although prepared in one or another field as the picture image outgoing end end of information-processing devices, such as the above word processors and a computer, you may take the gestalt of the reproducing unit combined with others, the reader, etc., and the facsimile apparatus which has a transceiver function further.

[0044]

problem of means by
a. combination

[Effect of the Invention] As explained above, according to this invention, the paper width detection means arranged in carriage detects the width of face of a record medium-ed, a record head is moved with carriage, and it records on a record medium-ed by breathing out ink. Moreover, the nozzle side of a record head is wiped by the nozzle depuration means. [0045] And since a ***** nozzle depuration means performs the dirt elimination operation to a paper width detection means to the decision of a dirt decision means which judges the dirt of a paper width detection means and the function of a paper width detection means is maintained normally, width of face of a record medium-ed is not recognized accidentally, and exact and suitable record is possible. In addition, since the nozzle depuration means prepared in the recording device also performs dirt elimination of a paper width detection means, it is not necessary to establish a new device, a cost rise can be pressed down, and this invention can be carried out.

[0046] Furthermore, when a nozzle depuration means performs the dirt elimination operation to a paper width detection means and the dirt of a paper width detection means is not removed, a paper width detection means can also make the above-mentioned effect a more positive thing as a configuration which displays the purport which is failure on a display means.

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Field

[Field of the Invention] This invention relates to the ink-jet recording device which breathes out ink from the record head which scans a record medium-ed, and records on a record medium-ed.

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Technique

[Description of the Prior Art] Drawing 2 is a perspective diagram showing the configuration schema of the ink-jet recording device which performs the conventional color record.

[0003] In drawing 2, the record media 1, such as a form or a plastics sheet, are supported with the conveyance rollers 2 and 3 of the couple arranged at the upper and lower sides of a record section, and are conveyed in the orientation of arrow head A with the conveyance roller 3 driven by the sheet delivery motor 4. Ahead of the conveyance rollers 2 and 3, the guide shaft 5 is formed in this and parallel. Along with this guide shaft 5, carriage 6 goes in the orientation of arrow head B through a wire 8 by the output of the carriage motor 7.

[0004] The record head 9 which is an ink-jet head is carried in the carriage 6 as a head move means. This record head 9 is an object for color pictures, is arranged at the scanning direction of carriage and consists of cyanogen (C), ***** (M), yellow (Y) and four record heads 9 that the ink of each color of black (Bk) was made to correspond, and were prepared, i.e., black head 9A, cyano head 9B, ***** head 9C, and yellow head 9D, respectively. Each record head sets a certain fixed spacing (for example, 12mm), and is arranged. Moreover, on carriage, the optical means 201 of the infrared reflex type sensor for detecting the paper width which is a scanning direction to a record medium-ed etc. is arranged. The ink regurgitation section arranged to the vertical single tier is prepared in the orientation which makes the ink delivery of a plurality (for example, 48 pieces or 64 pieces) the front face of each record head 9, i.e., the field which sets the recording surface and predetermined spacing (for example, 0.8mm) of a record medium 1, and opposes, intersect the scanning direction of carriage.

[0005] The display 65 containing Light Emitting Diodes for an alarm, such as two or more others and alarms Light Emitting Diode 61A, power Light Emitting Diode 61B, etc., is formed in the control panel 160 attached in the sheathing case (un-illustrating) of a recording device. [sections / key setting /, such as online / off-line switching key 60A line-feed key 60B, form-feed key 60C and recording-mode switching key 60D,]

[0006] When performing a record operation, on the basis of the record data sent from the host equipment 100, CPU with which the control section (un-illustrating) was equipped, and its circumference circuit use the sheet delivery motor 4 for conveyance first, and move the record medium 1-ed to a position. Next, the width of face (paper width) in the scanning direction of a record medium-ed is detected using the optical means 201 of an infrared reflex type sensor etc., moving carriage 6. The record data sent from the host equipment 100 on the basis of this paper width are processed, the record head 9 is controlled, and record suitable on the record medium 1-ed is performed.

[0007] The main fractions of the ink-jet record head (henceforth a record head) 9 of the ink-jet recording device which records by the ink-jet method consist of a nozzle fraction which carries out the regurgitation of an ink tank and the ink drop. A basic operation of such a record head is explained with reference to drawing 3.

[0008] Drawing 3 is a block diagram having shown typically record head 9 (either of the record heads 9A-9D is the same) cross section shown in drawing 2.

[0009] In drawing 3, two or more ink regurgitation nozzles 10 which prepared the ink delivery for making ink breathe out in the orientation which intersects perpendicularly with a scanning direction at the predetermined spacing are formed in the record head side which counters the record media 1-ed, such as the recording paper. Each ink regurgitation nozzle 10 is filled with ink 13. The electric thermal-conversion field 11 is formed in each ink regurgitation nozzle 10, respectively, and the heat driver 14 for turning on / turning off energization of this electric thermal-conversion field 11 is formed, respectively.

[0010] The circuit board equipped with the control circuit 29 for performing the above-mentioned energization control is arranged at carriage 6 (drawing 2). From this control circuit 29, a record data signal and a heat signal are outputted, respectively, and it is inputted into the record data serial/parallel-conversion circuit 16 and the heat signal generating circuit 17 on the record head 9, respectively. The heat driver 14 which should energize is chosen by the signal outputted from the circuit of these both.

[0011] If the heat driver 14 is chosen and energization is turned on, energization heating of the electric thermal-conversion fields (exoergic resistor etc.) 11 established to each ink regurgitation nozzle 10 will be carried out, they will make a film-boiling phenomenon occur in the ink in the ink regurgitation nozzle 10, and will generate a bubble (foam) 12. Ink is made to breathe out from the ink regurgitation nozzle 10 by the pressure buildup by this bubble 12, and flight ink drop 13A is formed. Record by the dot pattern is performed by making this ink drop 13A adhere on the record medium 1-ed.

[0012] Then, if energization of the exoergic resistor 11 is turned off, the ink regurgitation nozzle 10 will be cooled and a bubble 12 will disappear. And ink 13 is more newly than ink liquid route 10A supplied, and the ink regurgitation nozzle 10 is again filled with ink 13.

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Effect

[Effect of the Invention] As explained above, according to this invention, the paper width detection means arranged in carriage detects the width of face of a record medium-ed, a record head is moved with carriage, and it records on a record medium-ed by breathing out ink. Moreover, the nozzle side of a record head is wiped by the nozzle depuration means. [0045] And since a ***** nozzle depuration means performs the dirt elimination operation to a paper width detection means to the decision of a dirt decision means which judges the dirt of a paper width detection means and the function of a paper width detection means is maintained normally, width of face of a record medium-ed is not recognized accidentally, and exact and suitable record is possible. In addition, since the nozzle depuration means prepared in the recording device also performs dirt elimination of a paper width detection means, it is not necessary to establish a new device, a cost rise can be pressed down, and this invention can be carried out.

[0046] Furthermore, when a nozzle depuration means performs the dirt elimination operation to a paper width detection means and the dirt of a paper width detection means is not removed, a paper width detection means can also make the above-mentioned effect a more positive thing as a configuration which displays the purport which is failure on a display means.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The paper width detection means using the conventional optical means is explained with reference to drawing 4.

[0014] In drawing 4, 1 is record media-ed, such as paper, and 202 is a platen. 6 expresses carriage and carries each record head and the paper width detection sensor 201 of Y, M, C, and Bk.

[0015] The general internal configuration of the optical reflex type sensor 201 consists of photo diode 201a and photo transistor 201b, as shown in drawing 5. It is reflected on the platen 202 or the record medium 1-ed, and incidence of the light, such as infrared radiation emitted from photo diode 201a, is carried out to the light-receiving fraction of photo transistor 201b. The collector fraction of photo transistor 201b is beforehand connected with power (the example of illustration 5 V) through resistance, and the potential of this collector fraction is changed by the incident light, as shown in drawing 6.

[0016] The paper width detection means using the conventional optical means is recognized by detecting the level difference of the quantity of light in which it is reflected in case there is nothing with the time of there being a record medium-ed, namely, -- if larger [as compared with a certain fixed judgment level] in an output than it -- a platen -- if small, it will be judged as the record medium-ed

[0017] In an ink-jet recording device, since it records by making ink breathe out from a record head nozzle, when prolonged record is performed, the mist-like ink (it is called Myst below) which bounded from the record medium-ed may adhere to the aforementioned reflected type sensor 201. The level detected will be changed if a sensor 201 becomes dirty according to this Myst. Since the amount of incident lights becomes small, the level under record-medium-ed scanning goes up by the above-mentioned example, and in it, paper width becomes unable to detect correctly.

[0018] Since the same is said of the ** case by which photo diode 201a of a sensor was destroyed by a certain cause, in the equipment which has such a control, it may stop recording the further above-mentioned unusual status by judging that it is failure of a sensor accidentally.

[0019] This invention was accomplished in order to cancel the trouble of the above-mentioned conventional technique, it maintains the function of the optical sensor which detects the width of face (paper width) of the scanning direction of a record medium-ed, and aims at offering the ink-jet recording device which can perform exact and suitable record.

[Translation done.]

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MEANS

[Means for Solving the Problem] For this reason, the ink-jet recording device concerning this invention The nozzle depuration means which is the ink-jet recording device which records on a record medium-ed by breathing out ink from a record head, and wipes the nozzle side of a record head, A paper width detection means to arrange in the carriage to which a record head is moved, and to detect the width of face of a record medium-ed optically, The configuration characterized by having a dirt decision means to judge the dirt of a paper width detection means, and a control means to control a ***** nozzle depuration means to decision of a dirt decision means, and to make the dirt elimination operation to a paper width detection means perform to it tends to attain the aforementioned purpose.

[Translation done.]

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OPERATION

[Function] By the above configuration, the paper width detection means arranged in carriage detects the width of face of a record medium-ed, a record head is moved with carriage, and it records on a record medium-ed by breathing out ink. Moreover, the nozzle side of a record head is wiped by the nozzle depuration means.

[0022] And a control means controls a ***** nozzle depuration means to the decision of a dirt decision means which judges the dirt of a paper width detection means, performs the dirt elimination operation to a paper width detection means to it, and maintains the function of a paper width detection means normally.

[Translation done.]

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EXAMPLE

[Example] Drawing 1 is a block diagram showing the configuration of one example of this invention. In addition, conventionally [aforementioned], the same sign has shown equipment, the identity, or the corresponding fraction, and it omits a duplication explanation.

[0024] In drawing 1, it connects with the host equipment 100 through the interface 22, and CPU21 which is a microprocessor controls a record operation based on the command signal (command) and record information signal which were read into the working memory 25 from the program stored in the program memory 24 of ROM gestalt, the data memory 23 of EEPROM gestalt, etc., or record command data and the host equipment 100.

[0025] Moreover, when not recording, the motor for recovery 71 (drawing 1) for [which consists of the absorber and its designation member for wiping the capping device for protecting a record head and the nozzle side of a record head] wiping and operating the device 30 (drawing 1) and these is formed in the fraction hidden in the carriage 6 shown in drawing 2.

[0026] When performing a record operation, CPU21 and its circumference circuit on a control board (un-illustrating) move the record medium 1-ed to a position first using the sheet delivery motor 4 for conveyance on the basis of the record data sent from the host equipment 100. Next, the width of face (paper width) in the scanning direction of a record medium-ed is detected using the optical means 201 of an infrared reflex type sensor etc., scanning carriage 6. The record data sent from the host equipment 100 on the basis of this paper width are processed, the record head 9 is controlled, and record suitable on the record medium 1-ed is performed.

[0027] And CPU21 calculates the amount of the ink which carries out the regurgitation based on the recording information stored in data memory 23, and makes data memory 23 carry out the accumulation storage of this. When it becomes beyond the value with this amount of ink accumulation, it is wiped with carriage 6, CPU21 controls a device 30, wipes the front face of a sensor 201, and wipes it according to a device 30.

[0028] By the above-mentioned configuration, ink is breathed out from two or more record heads 9A-9D from which an ink color is different, and color record is performed. And it wipes and the nozzle side of a record head is wiped according to a device 30. Furthermore, when the ink of the specified quantity is breathed out, by wiping and wiping the front face of the optical means 201 which is a paper width sensor according to a device 30, paper width can always be detected correctly and suitable color ink-jet record can be carried out.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of one example.

[Drawing 2] It is the perspective diagram of the conventional ink-jet recording device.

[Drawing 3] It is the block diagram of a record head.

[Drawing 4] It is explanatory drawing of paper width detection.

[Drawing 5] It is the block diagram of a paper width detection sensor.

[Drawing 6] It is output explanatory drawing of a paper width detection sensor.

[Description of Notations]

1 Record Medium-ed

6 Carriage

9 Record Head

9A The record head for blacks

9B The record head for cyanogen

9C The record head for Magentas

9D The record head for yellow

10 Ink Regurgitation Nozzle

11 Electric Thermal-Conversion Field

12 Bubble (Foam)

13 Ink

13A Flight ink drop

14 Heat Driver

17 Heat Signal Generating Circuit

21 CPU

23 Data Memory

24 Program Memory

25 Working Memory

27 Carriage Motor Control Circuit

29 Record Head Control Circuit

30 Sweep and it is Device.

60A-60D Operation key

61A, 61B Alarm Light Emitting Diode

65 Display

100 Host Equipment

160 Control Panel

201 Paper Width Detection Sensor

202 Platen

[Translation done.]

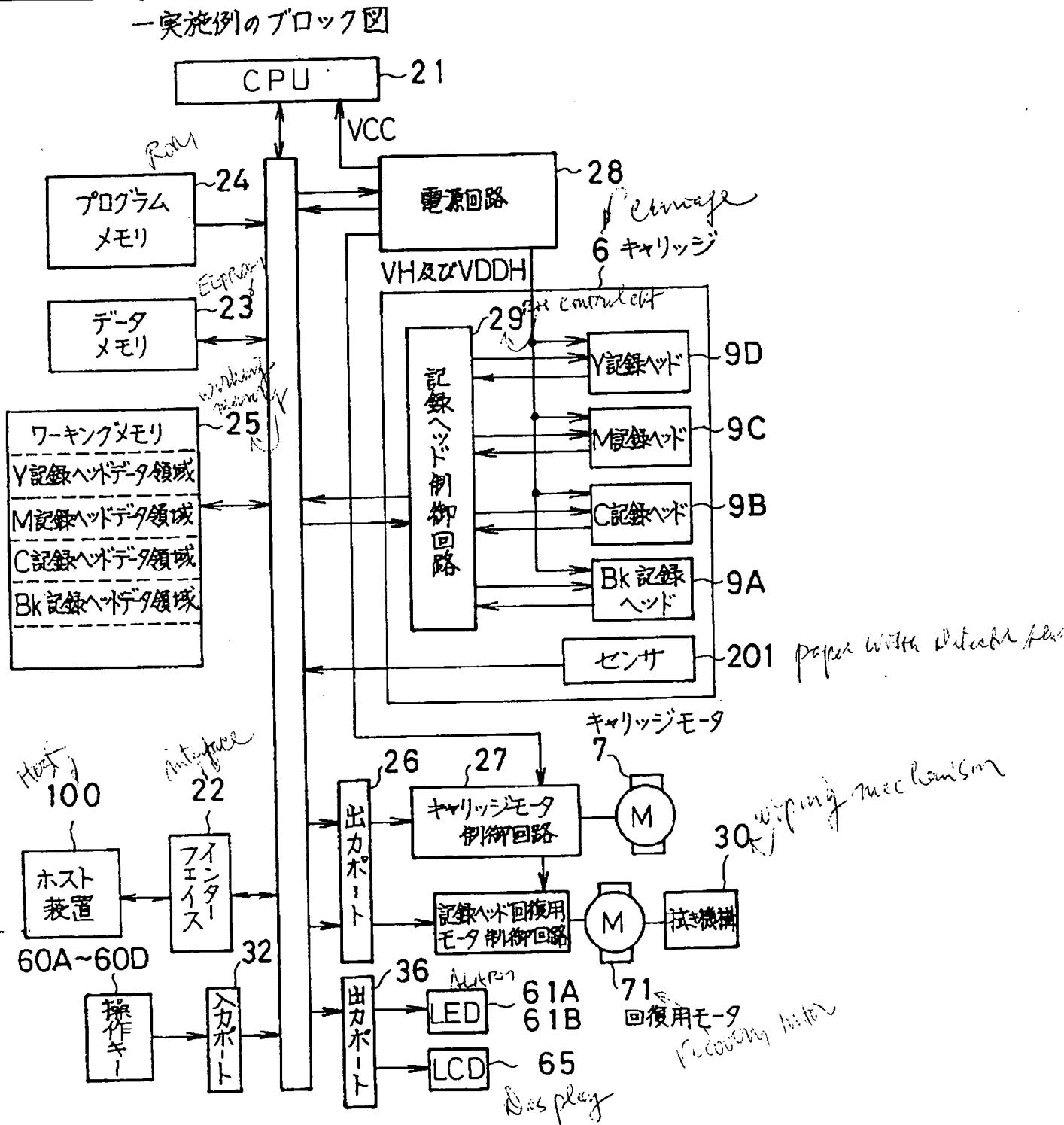
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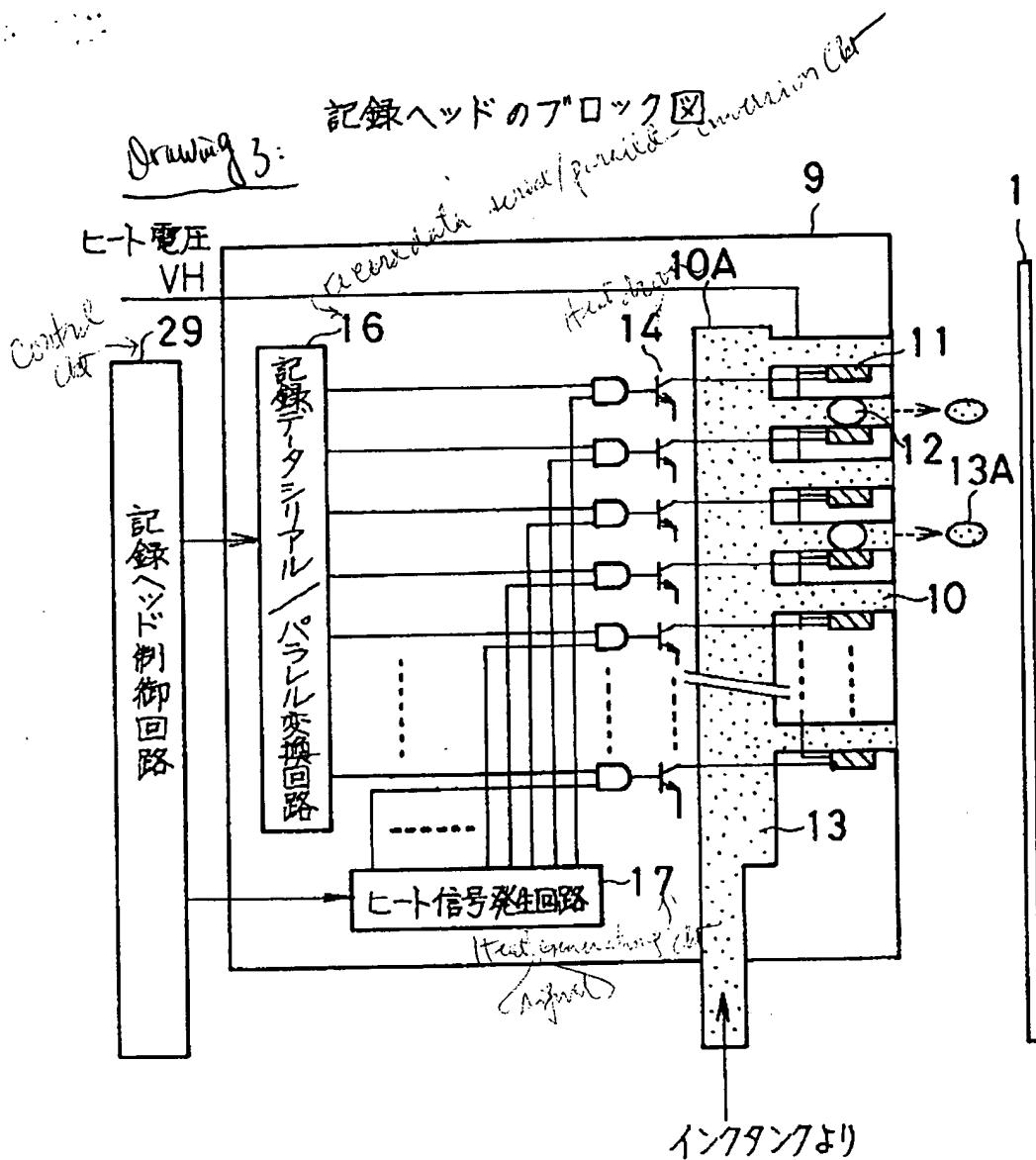
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DRAWINGS

[Drawing 1]



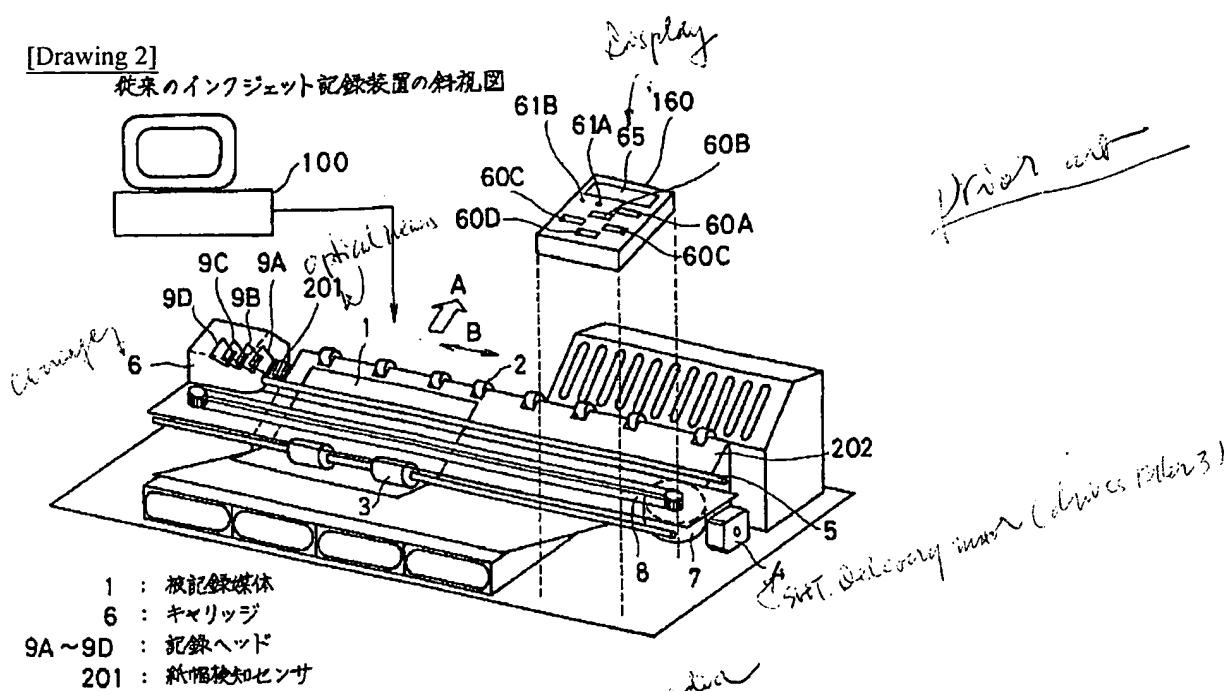


- 10 : インク吐出ノズル
- 11 : 電気熱変換体（発熱抵抗体）
- 12 : インクバルブ
- 13 : インク
- 14 : ヒートドライバ

[Drawing 5]

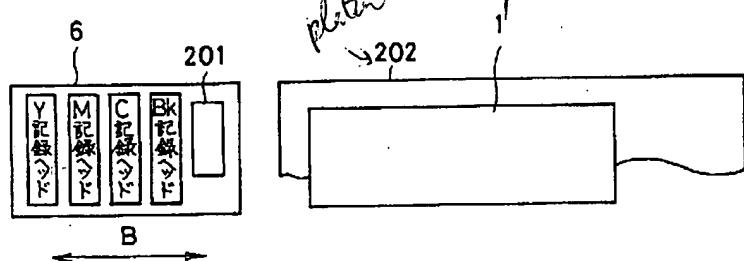
[Drawing 2]

従来のインクジェット記録装置の斜視図



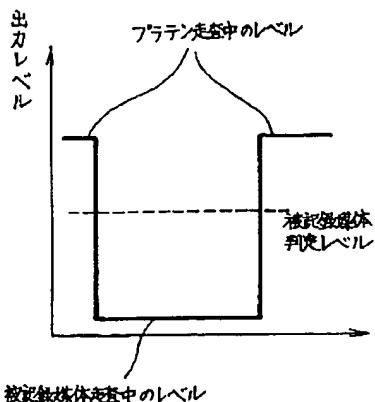
[Drawing 4]

紙幅検知の説明図



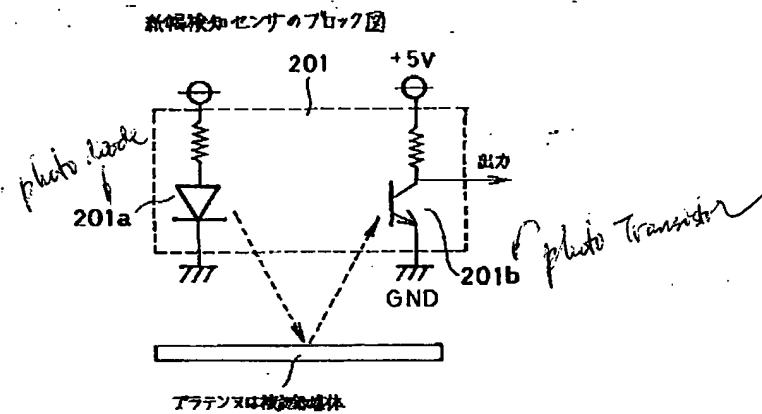
[Drawing 6]

紙幅検知センサの出力説明図



[Drawing 3]

【図5】 page 2 of 4 [0015]



フロントページの続き

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